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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/871,592	05/30/2001	Akira Arai	9319A-000221	8566 17
27572	7590	11/19/2003	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C.			SHEEHAN, JOHN P	
P.O. BOX 828			ART UNIT	
BLOOMFIELD HILLS, MI 48303			PAPER NUMBER	
			1742	

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/871,592

Applicant(s)

ARAI ET AL.

Examiner

John P. Sheehan

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-- Th MAILING DATE of this communication appears on the cov r sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10, 13-17 and 32-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 35-39 is/are allowed.
- 6) ☒ Claim(s) 1-9, 13-17 and 32-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1 to 8, 9, 13 to 17 and 32 to 34 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

I. In claim 1, in the third from the last line, the meaning of the phrase, "each ridge including a plurality of discreet, space apart regions" is not clear. What does this language mean? Does this language mean that the ridges are discontinuous, that is, a series of dashes?

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 10, 13 to 17 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Croat (US Patent No. 4,851,058, cited by the applicants in the IDS

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submitted August 31, 2001) in view of Toshio et al. (Toshio, Japanese Patent Document No. 09-271909).

Croat teaches a method of making a magnetic material having a composition that overlaps the alloy composition recited in the instant claims (column 2, lines 15 to 30).

Croat's method comprises melt spinning (column 4, lines 18 to 58), that is, "by colliding a molten alloy to a circumferential surface of a cooling roll so as to be cooled and solidify it" (applicants' claim 1, lines 2 to 4).

Toshio teaches a cooling roll for manufacturing a ribbon shaped metal alloy material wherein the cooling roll has a grooved surface so as to prevent the formation of air pockets, that is, dimples, produce a more uniform product and to improve the magnetic and mechanical properties of the ribbon metal alloy (English language abstract first paragraph). Toshio teaches that the grooves are V shaped (triangular shaped) as recited in applicants' new claim 33. Toshio teaches that the grooves are 0.1 to 50 microns wide and have a depth of about 10 microns or more. Toshio teaches that the groove width of 0.1 to 50 microns is such that the molten metal does not enter the groove (See paragraph 0013 of the English language translation submitted by the applicants). Toshio teaches a specific example of a cooling roll having a width of 30 microns and a pitch (interval) of 16 microns (See the English language translation submitted by the applicants, paragraph 0015, line 8). Toshio does not explicitly disclose the ratio of the area of the grooves to the total area of the cooling roll, however the Examiner considers that the ratio of the groove width to the sum of the groove width and

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groove pitch is equivalent to the ratio of the area of the grooves to the total area of the cooling roll. Based on Toshio's example;

$$\frac{\text{Groove Width}}{\text{Groove Width} + \text{Groove Pitch}} = \frac{30}{16+30} = 0.65 \text{ or } 65\%$$

Thus, this example teaches a groove width of 30 microns and a ratio of the grooves to the total area of the cooling roll of 65% which are encompassed by applicants' claim 1, which recites a groove width of 0.5 to 90 microns and a ratio of the groove area to the total area of the cooling roll encompassed by the instant claims value of 30 to 99.5%. Further, Toshio teaches a groove pitch (interval) of 200 microns or less (paragraph 0014, line 4). Again, Toshio does not explicitly disclose the ratio of the area of the grooves to the total area of the cooling roll, but taking a sampling of groove widths and groove pitches taught by Toshio:

Groove Width = 50 microns

Groove Pitch = 10, 60, 80, 100 and 200 microns

$$\frac{\text{Groove Width}}{\text{Groove Width} + \text{Groove Pitch}} = \frac{50}{50+10} = 0.83 \text{ or } 83\%$$

$$\frac{\text{Groove Width}}{\text{Groove Width} + \text{Groove Pitch}} = \frac{50}{50+60} = 0.45 \text{ or } 45\%$$

$$\frac{\text{Groove Width}}{\text{Groove Width} + \text{Groove Pitch}} = \frac{50}{50+80} = 0.38 \text{ or } 38\%$$

$$\frac{\text{Groove Width}}{\text{Groove Width} + \text{Groove Pitch}} = \frac{50}{50+100} = 0.33 \text{ or } 33\%$$

$$\frac{\text{Groove Width}}{\text{Groove Width} + \text{Groove Pitch}} = \frac{50}{50+200} = 0.20 \text{ or } 20\%$$

Groove Width + Groove Pitch 50+200

Thus, Toshio teaches ratios of the area of the grooves to the total area of the cooling roll that overlap the ratio of the area of the grooves to the total area of the cooling roll of 30 to 99.5% recited in applicants' claims and groove widths of 0.1 to 50 microns that overlap the groove width of 0.5 to 90 microns recited in applicants' claims.

Croat and the claimed process differ in that Croat does not teach the presence of "dimple correcting means" as recited in the instant claims.

However, one of ordinary skill in the art at the time the invention was made would have been motivated to modify Croat's cooling roll to a cooling roll having a grooved surface so as to prevent the formation of air pockets, that is, dimples, produce a more uniform product and to improve the magnetic and mechanical properties of the ribbon metal alloy as taught by Toshio (English language abstract first paragraph).

3. Claims 2, 3 and 5 to 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Croat taken in view of Toshio as applied to claims 1, 10 and 13 to 16 as set forth above, and further in view of Fukuno (Fukuno, US Patent No. 5,665,177, cited by the applicants in the IDS submitted May 30,2001).

Croat and Toshio teach and are applied as set forth above.

Fukuno teaches a cooling roll for manufacturing a ribbon shaped metal alloy material wherein the cooling roll has a grooved surface. Fukuno teaches that to minimize variation in the crystal size of the product, that is, to make a more uniform product, the cooling roll is preferably comprised of a base and a surface layer (column 6, lines 65 to 67). Fukuno teaches that the outer surface layer on the cooling roll should

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have a thermal conductivity lower than the thermal conductivity of the cooling roll base (column 7, lines 1 to 7) as recited in applicants' claim 3. Fukuno teaches a thermal conductivity of the cooling roll outer surface that overlaps applicants' claim 5 (column 7, lines 3 to 6). Fukuno teaches a cooling roll surface layer having a thickness of 10 to 100 microns (column 7, lines 18 to 20).

The claims and the combination Croat and Toshio differ in that Croat and Toshio do not teach a cooling roll comprised of a base and a surface layer nor do the references teach the thermal expansion coefficient as recited in applicants' claim 6.

However, one of ordinary skill in the art at the time the invention was made would have been motivated to modify Toshio's cooling roll to a cooling roll having a base and a surface coating so as to minimize the variation in crystal grain size and make the product more uniform as taught by Fukuno. Further, the determination of an appropriate thermal expansion coefficient for the surface layer of the cooling roll is considered well within the skill of one of ordinary skill in the art.

Double Patenting

The provisional obviousness-type double patenting based on the claims of copending Application No. 09/833,805 has been overcome by the terminal disclaimer submitted August 25, 2003.

Allowable Subject Matter

4. Claims 35 to 39 are allowed.

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5. Claims 4 and 32 and 34 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

I. Regarding claims 35 to 39, the primary reason for the indication of allowable subject matter is that none of the references alone or in combination teach or suggest a method of manufacturing ribbon shaped magnetic material having the composition recited in claim 35 comprising dividing dimples with a cooling roll having a plurality of ridges provided by at least two spiral grooves having different directions so that the grooves intersect on the circumferential surface of the cooling roll, wherein the grooves have an average width of 0.5 to 90 microns to prevent a molten alloy of the magnetic material from entering the groove.

II. Regarding claim 4, the primary reason for the indication of allowable subject matter is that none of the references alone or in combination teach or suggest a method of manufacturing a ribbon shaped magnetic material having the composition recited in claim 1, comprising dividing dimples with a cooling roll having a plurality of ridges provided by grooves having an average width of 0.5 to 90 microns to prevent a molten alloy of the magnetic material from entering the groove wherein the outer surface of the cooling roll is formed of a ceramic.

III. Regarding claims 32 and 34, the primary reason for the indication of allowable subject matter is that none of the references alone or in combination teach or

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suggest a method of manufacturing a ribbon shaped magnetic material having the composition recited in claim 1, comprising dividing dimples with a cooling roll having a plurality of ridges provided by grooves having an average width of 0.5 to 90 microns to prevent a molten alloy of the magnetic material from entering the groove wherein the cross section of the grooves is square shaped or round shaped as recited in claims 32, and 34 respectively.

Response to Arguments

7. Applicant's arguments filed August 25, 2003 have been fully considered but they are not persuasive.

Applicants argument that, "Toshio does not teach a plurality of ridges that are provided by forming a plurality of grooves at an angle less than or equal to 30° relative to an edge of the cooling roll wherein each ridge includes a plurality of discreet, spaced apart regions" is not persuasive. The grooves on Toshio's cooling roll are disclosed as at an angle of greater than 0° to less than 90° (see the English language abstract and paragraph 0012). Thus Toshio teaches a groove angle that encompasses the instantly claimed angle of "less than or equal to 30° ". Further, Toshio's Figures a, b and c teach a plurality of grooves that form a plurality of ridges as recited in the instant claims. Regarding the limitation, "wherein each ridge includes a plurality of discreet, spaced apart regions" it is the Examiner's position that as set forth above in this Office action the meaning of this language is not clear and therefore cannot be considered as distinguishing over the prior art.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P. Sheehan whose telephone number is (703) 308-3861. The examiner can normally be reached on T-F (6:30-5:00) Second Monday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (703) 308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.



John P. Sheehan
Primary Examiner
Art Unit 1742

jps
November 4, 2003